

7.1 notes

Random-

- Uncertain/Unknown outcomes on each trial
- Long run.... there is a predictable pattern

Probability -

percent of times an outcome occurs.

Experimental Prob - what did happen in our expt.
 $P(H) = 12/30 = 40\%$

Theoretical Prob - what should happen
 $P(H) = 1/2 = 50\%$

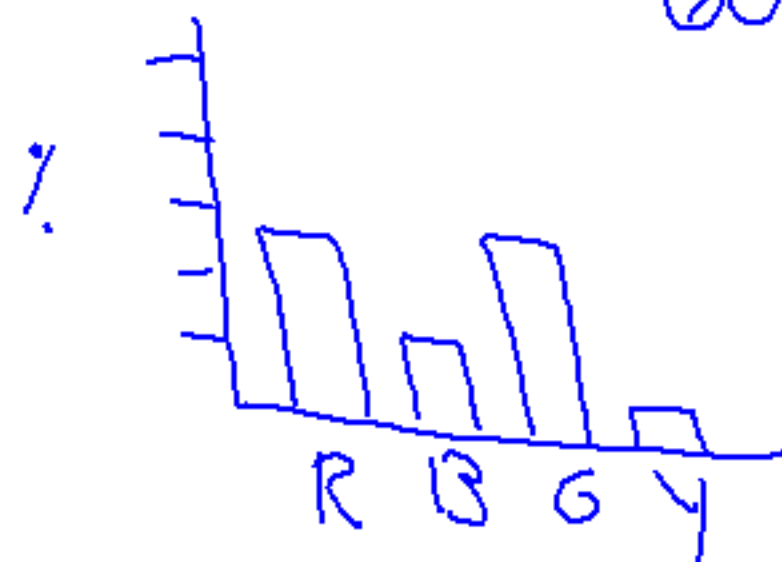
Prob. Model =

- List of all poss. outcomes
- Probability of each outcome

Ex: Coin toss

* outcome	H	T
Prob	0.6	0.4
	60%	40%

Spinners



Sample Space -

- the set of all possible outcomes

Ex: Hit / Miss

R, B, G, Y

2-12

$A, B, C, \text{ etc.} = \text{events}$

$P(A)$ = probability of event A occurring

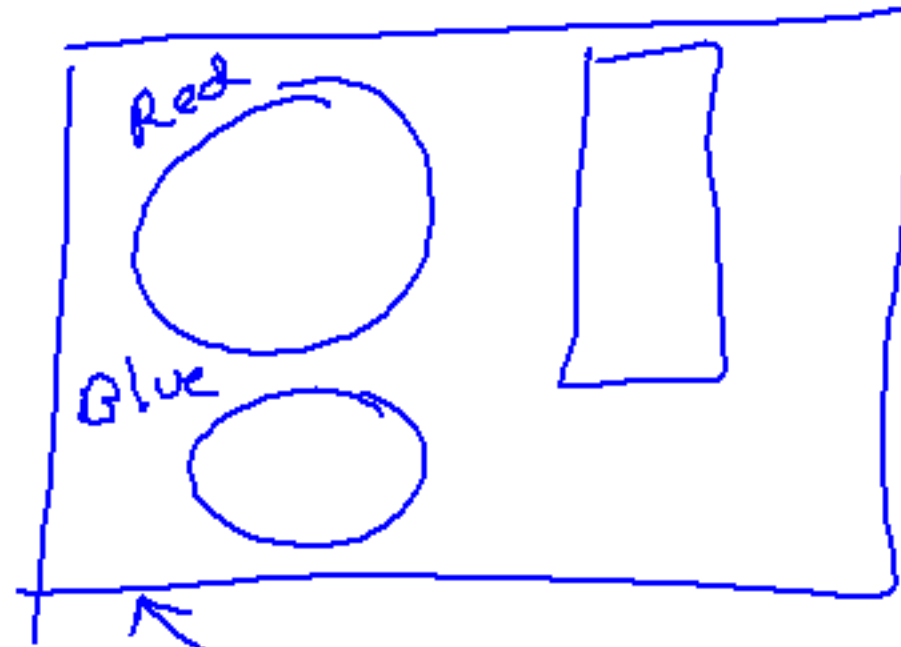
$$E_X: P(H)$$

S = sample space
(all outcomes)

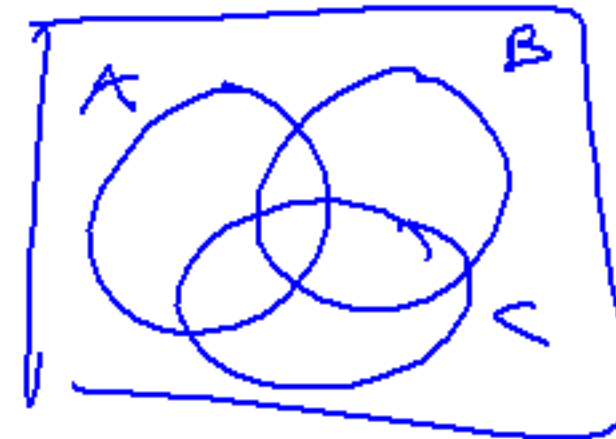
Venn Diagrams

use shapes to represent events

Ex:

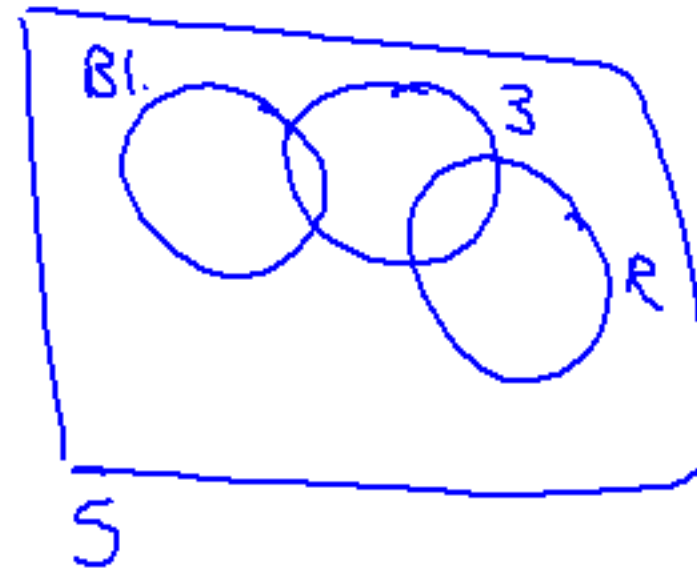


Sample Space



$P(H)$

~~A~~ $S = H \text{ and } T$

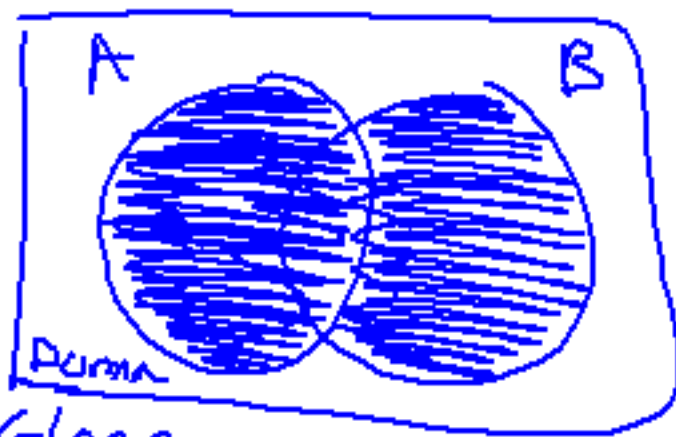


Picking card from deck

Union: meaning: joining, OR

Symbol: \cup

Ex: 1



$A \cup B$

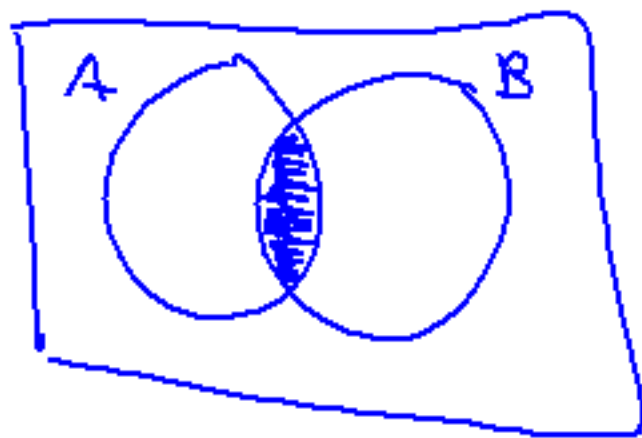
Ex 2: $A \cup B: \{1, 2, 3, 4, 5, 6, 7, 8, 10, 12\}$

Intersection:

meaning: overlap, things in common
AND

Symbol: \cap

Ex: 1



$A \cap B$

Ex 2:

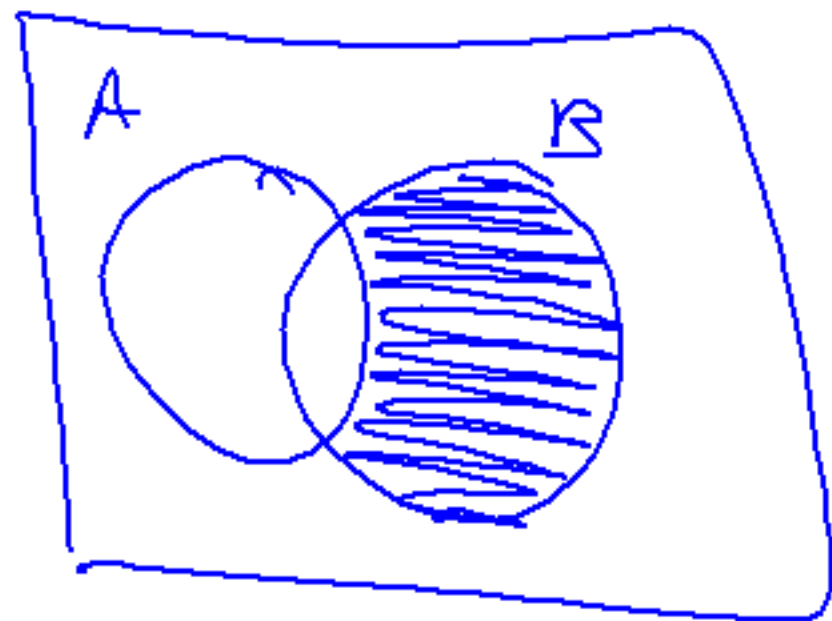
$$A \cap B = \{2, 4, 6\}$$

Complement (of A)

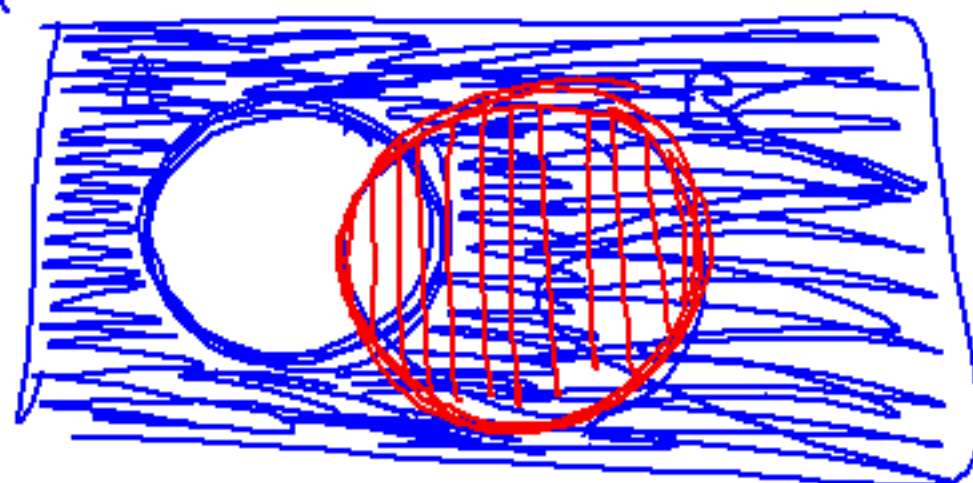
meaning: - everything except A
- prob. of A not happening

Symbol: A^c

$A^c \cap B$



A^c



$$A^c = \{1, 3, 5, 7, 9, 11, 13, 14, 15\}$$

$$A + A^c = S$$

$$B + B^c = S$$

$$\textcircled{1} A \cap B = \{3, 7, 11, 13, 15\}$$

$$\textcircled{9} P(A \cap B) = \frac{5}{25} = \frac{1}{5} = 20\%$$

$$\textcircled{2} A \cup B = \{1, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, \\ 17, 19, 21\}$$

$$\textcircled{10} P(A \cup B) = \frac{15}{25} = \frac{3}{5} = 60\%$$

Answers to 1st practice:

3) $\{1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 23, 24, 25\}$

4) $\{2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24\}$

5) NOTHING

6) $\{\text{all except } 18, 23\}$

7) $\{6, 8, 10, 14\}$

8) $\{1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25\}$

11) 15/25

12) $1\frac{1}{2}5$

13) $0/25 = 0\%$

14) 23/ 25

15) 10/25

16) 10/25

Answers to 2nd worksheet:

a) 8/20

c) none

e) $\{3,4,5,6,7,8,11,13,15,16,17,22,28,30\}$

g) 9/20

i) 12/20

k) 8/20

m) 11/ 20

o) 3/ 20

q) 15/ 20

b) 7/20

d) $0/20 = 0\%$

f) 14/20

h) 8/20

j) 13/ 20

l) 3/ 20

n) 5/20

p) 11/ 20

r) ~~2/20~~

3/20

$$P(E^c) = \frac{13}{20}$$

Prob. Rules

$$\textcircled{1} \quad 0 \leq P(A) \leq 100\%$$

$$\textcircled{2} \quad P(S) = 100\%$$

* sum of probability of all outcomes = 100%

$$\textcircled{3} \quad P(A^c) = 100\% - P(A)$$